

DENMARK, THE FAROE ISLANDS, AND GREENLAND

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DENMARK

Denmark is an industrialized market economy with a gross domestic product (GDP) of \$161 billion in 2001. Slow economic growth was noted with only 0.9% increase in the GDP. Its standard of living was among the highest in the world with a per capita income of \$31,151. The country depended on imported raw materials and foreign trade. Denmark's mineral resources are mainly fossil fuels that are located in natural gas and petroleum fields in the North Sea. The nonfuel minerals industry included mining and quarrying of chalk, clays, diatomite, limestone, and sand and gravel and production of secondary aluminum and crude steel and its semimanufactures.

Denmark's relatively high drilling activity was due to commitment wells on fifth-round acreage. Oil discoveries were made by Dansk Operatørselskab IS at Nini 1A and Cecilie 1A. Oil production in 2001 totaled 14.1 million metric tons (Mt), or 88,100 barrels, which was up by 0.3% compared with that of 2000. Denmark was the third largest oil producer in western Europe after Norway and the United Kingdom (Alexander's Gas & Oil Connections, 2002§¹).

A group led by UAB Minijos Nafta was awarded a 364,000-hectare 6-year license 1/01 in southern Jutland in the Zechstein basin. Initial work involved evaluation of existing data, seismic reprocessing, a pilot geochemical survey, and prospect-lead definition. The group also included Sterling Resources Ltd. of Canada, DONG of Denmark, and Dansk Venture Olieeftersforskning Aps (Oil & Gas Journal, 2001a).

Oil was found in sandstones of late Jurassic age in Phillips Petroleum International Corp. Denmark's Hejre-1 exploration well on license 5/98 in the northern Danish central graben. The ENSCO rig would be moved to a position in the eastern part of the central graben to drill exploration well Svane-1 on license 4/98 (Oil & Gas Journal, 2001b).

The Denerco Group made two new oil discoveries in the Danish part of the North Sea under license 16/98. The group initially found oil with its Cecilie-1 well at a location about 13 kilometers (km) southwest of the Siri Field. Test production from the well yielded oil at a rate of up to 1,888 barrels per day (bbl/d). The group also completed the Connie-1 exploration well under the same license and found oil in sandstones of Palaeocene age (Danish Environment & Energy Newsletter, 2001§).

Amerada Hess Corp. of the United States sold its 26% stake in Denerco Oil (a subsidiary of Deneco Group). The divestment

left Denerco Oil with 11 owners led by Danish LD Energi/LD Energi Offshore with a 34% stake and DPE (a Danish consortium) with 25%. Other leading shareholders included Danske Bank and the engineering group FLS Industries. Denerco Oil and Amerada Hess would continue cooperation in Denmark's South Arne North Sea offshore field (Yahoo Finance, 2001§).

Dansk Undergrunds Consortium submitted a \$520 million plan for further development of the Halfdan Field off Denmark. The phase 3 development plan included drilling 11 wells and 11 related water injection wells. The central platform would be extended with a facility for processing and compression of gas and a facility for processing of produced water. Overall production from the field was to increase to 100,000 bbl/d in 2005. The consortium included A.P. Moller Co., Maersk Olie og Gas, Royal Dutch/Shell Group, and Chevron Texaco Corp. (Oil & Gas Journal, 2001d).

A gas explosion on North Sea offshore Gorm Field in May led to a production halt on Gorm and its four satellite fields, Dagmar, Halfdan, Rolf, and Skjold. Production on Halfdan resumed in July with the rest of the fields not fully operative until September (Alexander's Gas & Oil Connections, 2001b§).

Statoil AS of Norway stopped flaring gas at its marginal North Siri Field in a Danish offshore installation. The field is in 60 meters (m) of water on block 5604/20 on the Ringkobing-Fyn high. It would be either used in power generation or re-injected by produced water. Injecting produced water increased wear on the injection pumps, and their design was to be modified. The installation produced 30,000 bbl/d of oil beginning in March 1999 and was to cease production between 2005 and 2007 (Oil & Gas Journal, 2001e).

FAROE ISLANDS

The Faroe Islands have been a self-governing community within the Kingdom of Denmark. Their territorial waters could be the next oil frontier for the North Sea oil industry. Cod fishing is the island's only industry, which earned more than 90% of total income. Offshore oil drilling, however, began in 2001. Statoil and its partner Enterprise Oil started the first exploration well on the Longan prospect off the Faroe Islands in June. The well held traces of hydrocarbons, but no commercial oil. British Petroleum and Faroese Partnership, which comprised BG, DONG, and Atlantic Petroleum Corp., with Amerada Hess as the operator, were scheduled to drill one well in late summer. The well was very close to the United Kingdom-Faroes boundary (Alexander's Gas & Oil Connections, 2001a§). The well on license 001 in the Faroese

¹References that include a section twist (§) are found in the Internet References Cited section.

offshore discovered light oil and gas and was drilled to a total depth of 4,275 m.

The home-rule Government has full authority over hydrocarbon activity in its territory. The first bidding round was opened in February 2000. By August, the Government had awarded seven licenses that cover 38 blocks and part blocks (Oil & Gas Journal, 2001c).

GREENLAND

Greenland's mineral and petroleum resources have not been developed, although increased exploration activities for diamond and gold were noted in 2001. Other mineral commodities explored for included base metals, industrial minerals, iron, nickel, and platinum-group metals. Exploration drillings in offshore areas were active, but yielded no oil or gas.

Crew Development Corp. of Canada acquired a 50% interest in the Nalunaq project, which was a high-grade gold deposit 40 km from Nanortalik near the southern tip of Greenland, by merging with Mindex ASA of Norway. Crew had a two-thirds interest in the joint-venture Nalunaq I/S, and the Government-owned NunaMinerals A/S held the remainder. Crew had conducted extensive underground development and bulk sampling to provide the data for a final feasibility study and subsequent financing. The target of the test program was a resource that could support ore production of 500 metric tons per day, which could result in an output of 4,600 kilograms per year of gold. An indicated and inferred resource of 440,000 metric tons (t) was determined with an average grade of 32 grams per metric ton gold (Miners News, 2001). A test-mining program had developed four stopes at Nalunaq and was used to assess the mining method.

Cabot Corp. of the United States planned to raise its stake in Angus & Ross Plc, which had the mining rights to an area that covers 414 square kilometers around Narsarsuq in southern Greenland and would start drilling tests for tantalum. The columbium (niobium)-tantalum mineralization was in the form of pyrochlore and found outside the existing deposit in the Anjing Hitam zone. Several mineralized zones, which include a 50-Mt resource with grades of 0.03% to 0.1% tantalum oxide and a 130-Mt resource with columbium (niobium) oxide grades of 0.4% to 1.0%, were identified (Mining Journal, 2001b). Cabot had options to acquire 1 million shares (4.99%) and to subscribe to 4 million new shares and a further 5 million new shares in the future. In return, it would agree to buy 50% of any eventual production. Cabot was one of the world's largest producers of refined tantalum oxide. Since 1999, world tantalum demand has been growing at a rate of 10% per year and was 1,810 t in 2001. Angus & Ross would use some of the proceeds raised to carry out the test drilling (Financial Times, 2001§). Preliminary field work included mapping and sampling and further definition of mineralized zones and would be followed by test and delineation drilling and additional geologic evaluation and metallurgical test work.

Diamond exploration in Greenland was concentrated on an Archaean cratonic shield area along the southwestern coast. Targets were 8-km-long diamondiferous kimberlite dikes that contained several small pipes. No economic prospects have been outlined. The exploration companies included Citation

Resources Inc. of Canada in joint ventures with De Beers and Dia Met Minerals Ltd. (Mining Journal, 2001a). Citation Resources also reported that sulfide mineralization that carries anomalous polymetallic values was intersected during drilling on joint-venture ground in west Greenland.

The drilling of one wildcat, Statoil's Qulleq 1, was dry but found reservoir-quality Cretaceous sandstones. Meanwhile, the Government invited nominations for areas of interest ahead of a planned round of licensing in 2001 off the southwestern coast.

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Major Source of Information

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TABLE 1
DENMARK: ESTIMATED PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity	1997	1998	1999	2000	2001
Aluminum metal, secondary	14,000	14,000	14,000	16,000	16,000
Cement, hydraulic	2,683,039 3/	2,077,000 r/ 3/	1,926,000 r/ 3/	2,009,000 r/ 3/	2,010,000
Chalk	427,634 3/	425,000	400,000	400,000	410,000
Clays:					
Fire clay	20 3/	20	20	25	25
Kaolin	3,000	2,500	2,500	2,500	2,000
Other	8,000	6,000	6,000	6,500	6,500
Moler, extracted thousand cubic meters	185	185	185 r/	185	185
Gas:					
Manufactured terajoules	1,500	1,500	1,500	1,500	1,500
Natural:					
Gross million cubic meters	9,530	9,600	9,600	9,700	9,700
Marketable do.	6,960 3/	7,000	7,000	7,100	7,100
Iron and steel metal, steel:					
Crude thousand metric tons	787 3/	790 3/	748 3/	750 3/	760
Semimanufactures do.	625	706 3/	600	700	700
Lime, hydrated and quicklime	115,129 3/	116,000	115,000	115,000	114,000
Natural gas plant liquids thousand 42-gallon barrels	45,000	45,000	45,000	46,000	46,000
Nitrogen, N content of ammonia	1,600	1,600	1,600	1,600	1,600
Peat	205,000	205,000	200,000	200,000	200,000
Petroleum:					
Crude thousand 42-gallon barrels	83,950 3/	84,000	84,000	87,860 r/ 3/	88,130 3/
Refinery products:					
Liquefied petroleum gas do.	1,600	1,600	1,600	1,700	1,700
Gasoline do.	30,200	30,000	30,000	30,000	30,000
Naphtha do.	1,200	1,200	1,200	1,300	13,000
Jet fuel do.	1,800	1,800	1,800	2,000	2,000
Kerosene do.	100	100	100	100	100
Distillate fuel oil do.	28,000	28,000	28,000	28,200	28,500
Refinery gas do.	1,600	1,600	1,600	1,700	17,000
Lubricants do.	300	300	300	300	300
Residual fuel oil do.	13,500	13,500	13,000	13,000	13,000
Petroleum coke do.	60	60	60	60	60
Total do.	78,400	78,200	77,700	78,400	78,700
Phosphates, crude, gross weight	1,200	1,200	1,200	1,300	1,300
Salt, all forms	600,000	600,000	600,000	605,000	605,000
Sand and gravel:					
Onshore thousand cubic meters	18,000	18,000	18,000	18,000	18,000
Offshore do.	5,000	5,000	5,000	5,000	5,000
Total do.	23,000	23,000	23,000	23,000	23,000
Of which, sand, industrial (sales) do.	50	50	50	50	60
Stone:					
Dimension (mostly granite)	26,000	26,000	26,000	27,000	27,000
Limestone:					
Agricultural	700,000	700,000	700,000	700,000	700,000
Industrial	250,000	250,000	250,000	250,000	250,000
Sulfur, byproduct	10,585 3/	10,000	10,000	10,500	11,000

r/ Revised.

1/ Table includes data available through June 5, 2002. Estimated data based on sales of domestically produced mineral commodities.

2/ Estimated data are rounded to no more than three significant digits; may not add to totals shown.

3/ Reported figure.